



MarinTrust Standard V2

By-product Fishery Assessment Bigeye tuna (*Thunnus obesus*) in FAO zone 34, 47 Atlantic Eastern Central, Southeast, 41 Atlantic Southwest

MarinTrust Programme

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Table 1 Application details and summary of the assessment outcome

Fishery Under Assessment	Species:	Bigeye tuna, <i>Thunnus obesus</i>
	Geographical area:	FAO zones 34, 47 Atlantic Eastern Central, Southeast, 41 Atlantic Southwest
	Country of origin of the product:	Flag country: El Salvador, Ecuador, Spain, Panama
	Stock:	Atlantic Bigeye tuna in FAO zone 34, 47 Atlantic Eastern Central, Southeast, 41 Atlantic Southwest
Date	13 September 2022	
Report Code	SLV06	
Assessor	Léa Lebechnech	
Country of origin of the product - PASS	Flag country: El Salvador, Ecuador, Spain, Panama	
Country of origin of the product - FAIL	NA	

Application details and summary of the assessment outcome			
Company Name(s): Calvo Conservas El Salvador S.A. de C.V.			
Country: El Salvador			
Email address: mauricio.flores@grupocalvo.com.sv		Applicant Code:	
Certification Body Details			
Name of Certification Body:		Global Trust Certification	
Assessor	Peer Reviewer	Assessment Days	Initial/Surveillance/ Re-approval
Léa Lebechnech	Matthew Jew	0,5 days	Surveillance 1
Assessment Period	To September 2022		

Scope Details	
Main Species	Bigeye tuna, <i>Thunnus obesus</i>
Stock	Atlantic bigeye tuna in FAO zone 34, 47 Atlantic Eastern Central, Southeast, 41 Atlantic Southwest
Fishery Location	FAO zone 34, 47 Atlantic Eastern Central, Southeast, 41 Atlantic Southwest
Management Authority (Country/ State)	ICCAT
Gear Type(s)	Purse seines, longlines and bait boat
Outcome of Assessment	
Peer Review Evaluation	Agree with recommendation
Recommendation	NOT APPROVED

Table 2. Assessment Determination

Assessment Determination
If any species is categorised as Endangered or Critically Endangered on IUCN's Red List, or if it appears in the CITES appendices, it cannot be approved for use as Marin Trust raw material. Bigeye tuna <i>Thunnus obesus</i> is neither listed as Endangered or Critically Endangered on IUCN's Red List ("vulnerable"), nor listed in CITES appendices; therefore, bigeye tuna is eligible for approval for use as Marin Trust by-product raw material. At this point in time, it is assumed there is a single Atlantic-wide population of bigeye tuna. This is based on a lack of identified genetic heterogeneity, time/area distribution of fish and movement patterns of tagged fish, therefore, the Atlantic stock is considered in this report. The fishing mortality rate which, if applied constantly, would result in Maximum Sustainable Yield (MSY). The International Commission for the Conservation of Atlantic Tunas (ICCAT) uses two reference points to determine the status of bigeye tuna populations in the Atlantic, $B_{current}/B_{MSY}$ and $F_{current}/F_{MSY}$. Therefore, the stock is subject to specific management regime and reference points are available to define the stock status relative to. Therefore, it was assessed under Category C. Removals of the species are considered in the stock assessment and the stock PASSES clauses C1.1. However, the most recent assessment (2019) indicates that the stock is at 58% overfished, and probability of overfishing is 50%, so it FAILS clauses C1.2. As per guidance, the stock has been assessed under category D: with an average productivity of 2 and susceptibility of 2.25, the stock did not pass the PSA risk rating. It has been then assessed with the Table D4: it met clause D4.1 but failed clause D4.2. Therefore, Atlantic Ocean bigeye tuna <i>Thunnus obesus</i> in FAO zone 34, 47 Atlantic Eastern Central, Southeast, 41 Atlantic Southwest, is NOT APPROVED for the production of fishmeal and fish oil under the current MarinTrust v 2.0 by-products standards.
Fishery Assessment Peer Review Comments
The internal peer reviewer agrees with the assessor's determination, who correctly classified bigeye tuna (<i>Thunnus obesus</i>) in FAO Area 34, 41, and 47 under Category C, as reference points are defined to assess status of stock relative to, and there is a specific management regime in place. Fishery removals are included in the stock assessment and it PASSES Clause C1.1. The stock is considered, in its most recent assessment, to have biomass below biomass reference point. "The Atlantic bigeye tuna stock in 2019 was estimated to be overfished but not undergoing overfishing" (ICCAT 2021b). Thus, it FAILS Clause C1.2. The assessor correctly assigned values for the PSA risk rating. The productivity score of 2 and susceptibility score of 2.25 indicates (via Table D3) that the stock must be assessed under Table D4. Potential impacts of the fishery are considered in the management process, Clause D4.1 passes. However, there is evidence that the fishery has significant negative impacts on the species and thus fails Clause D4.2. Therefore the assessor's recommendation to NOT APPROVE Atlantic bigeye tuna for the production of fishmeal and fish oil is the correct recommendation.
Notes for On-site Auditor
N/A

Species Categorisation

NB: If any species is categorised as Endangered or Critically Endangered on the IUCN Red List, or if it appears in CITES Appendix 1, it **cannot** be approved for use as an MarinTrust raw material.

IUCN Red list Category

By-product material from a species listed by IUCN (the International Union for Conservation of Nature) under the Red List for the following categories shall immediately fail the assessment;

- EXTINCT (E) AND EXTINCT IN THE WILD (EW)
- CRITICALLY ENDANGERED (CR) facing an extremely high risk of extinction in the wild.
- ENDANGERED (EN) facing a very high risk of extinction in the wild.

By-product material may be used from the following categories provided that all clauses in the MarinTrust standard are passed.

- VULNERABLE (VU) facing a high risk of extinction in the wild.
- NEAR THREATENED (NT) does not qualify for above now, but is close or is likely to qualify for, a threatened category in the near future.
- LEAST CONCERN (LC) Widespread and abundant.
- DATA DEFICIENT (DD) and NOT EVALUATED (NE)

Table 3 Species Categorisation Table

Common name	Latin name	Stock	Management	Category	IUCN Red List Category ¹	CITES Appendix 1 ²
Bigeye tuna	<i>Thunnus obesus</i>	Atlantic bigeye tuna (FAO zone 34, 47 Atlantic Eastern Central, Southeast, 41 Atlantic Southwest)	International Commission for the Conservation of Atlantic Tunas (ICCAT)	D	VU	No

¹ <https://www.iucnredlist.org/>

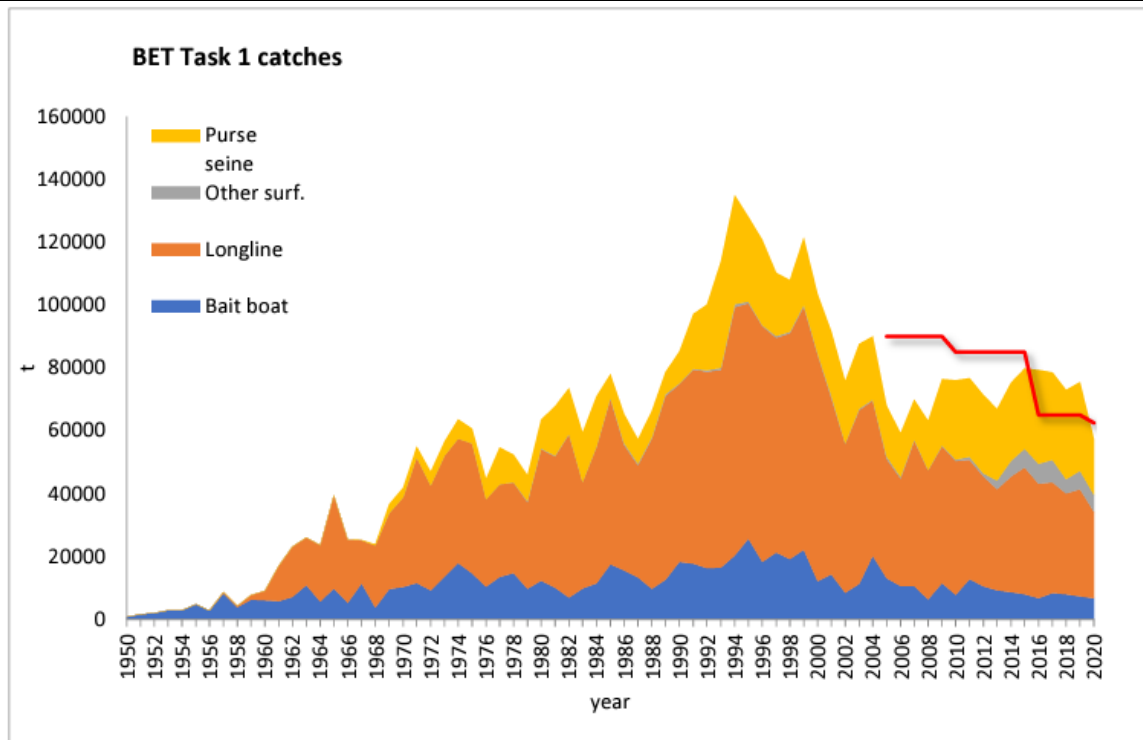
² <https://cites.org/eng/app/appendices.php>

CATEGORY C SPECIES

In a by-product assessment, Category C species are those which are subject to a species-specific management regime and are usually targeted species in fisheries for human consumption.

Clause C1 should be completed for each Category C species. If there are no Category C species in the fishery under assessment, this section can be deleted. Where a species fails this Clause, it should be assessed as a Category D species instead.

Species Name		Bigeye tuna (<i>Thunnus obesus</i>)																									
C1	Category C Stock Status - Minimum Requirements																										
	C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible.	Yes																								
	C1.2	The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.	No																								
Clause outcome:			FAIL																								
C1.1 Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible. A stock assessment for bigeye tuna was conducted in 2021 (Anon. 2021a) through a process that included a data preparatory meeting in April and an assessment meeting in July. The stock assessment used fishery data from the period 1950-2019 and indices of relative abundance used in the assessment were calculated through 2019 (Figure 1, named “BET-Figure3”, TAC is represented by the red line). The reported catches by the countries under assessment in the last five years were as follows: <table><tr><th>Year/Catches (tonnes)</th><th>El Salvador</th><th>Spain</th><th>Panama</th></tr><tr><td>2016</td><td>1,450</td><td>11,469</td><td>2,337</td></tr><tr><td>2017</td><td>1,826</td><td>11,544</td><td>1,664</td></tr><tr><td>2018</td><td>2,634</td><td>8,400</td><td>2,067</td></tr><tr><td>2019</td><td>2,464</td><td>9,117</td><td>3,052</td></tr><tr><td>2020</td><td>1,518</td><td>6,050</td><td>1,707</td></tr></table>				Year/Catches (tonnes)	El Salvador	Spain	Panama	2016	1,450	11,469	2,337	2017	1,826	11,544	1,664	2018	2,634	8,400	2,067	2019	2,464	9,117	3,052	2020	1,518	6,050	1,707
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BET-Figure 3. Bigeye tuna estimated and reported catches for all the Atlantic stock (t). The value for 2020 represents catch reports until September 18, 2021.

Source: ICCAT 2021b

Therefore, fishery removals of the species in the fishery under assessment are included in the stock assessment process, so it PASSES Clause C1.1.

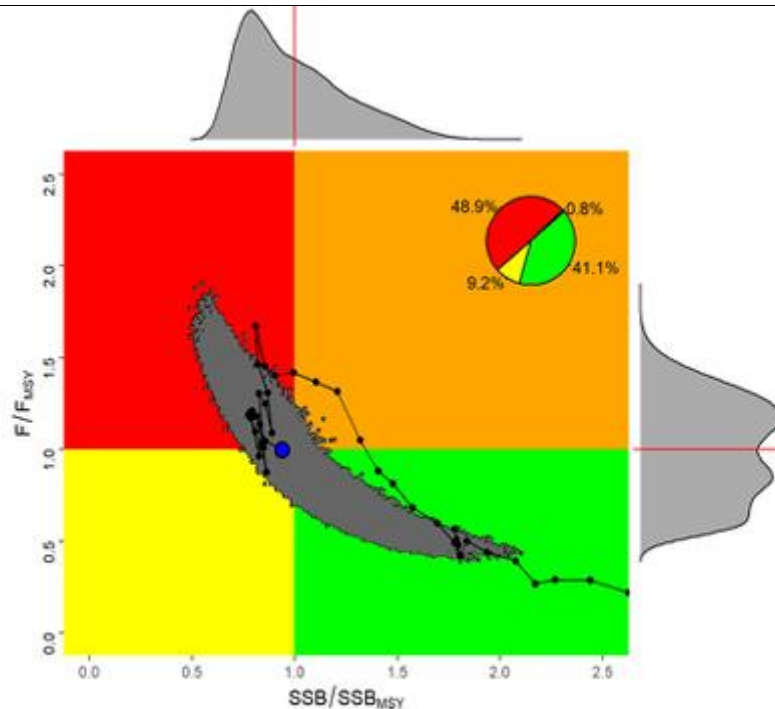
C1.2 The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.

The 2021 stock assessment was conducted using similar assessment models to those used in 2018, updating the data until 2019, but with some significant changes in natural mortality assumptions, derived from new information and new assumptions on maximum age, the relative abundance indices used and the fleet structure of the model used for providing management advice.

The Atlantic bigeye tuna stock in 2019 was estimated to be overfished but not undergoing overfishing. According to the Kobe strategy matrix, a future constant catch of 61,500 t, which is the TAC established in Rec. 19-02, will have a high probability (97%) of maintaining the stock in the green quadrant of the Kobe plot by 2034.

Furthermore, it needs to be noted that the estimated catches for 2020 and the assumed catches for 2021 (=TAC= 61,500 t) result in a strong reduction of fishing mortality and a growth in SSB in those two first years of the projection period. This leads to a prediction that the BET stock at the end of 2021 will be in a significantly better status (probability of being in the green zone > 80%) than the stock at the end of the last year of the assessment in 2019 (probability of being in the green zone=41%). The rapid change in probabilities of overfishing and overfished during 2020 and 2021 are the result of the fact that estimated stock status is close to the centre point of the Kobe plot. When a stock is at such centre point, decreases in fishing mortality initially lead to large changes in these probabilities as can be seen from the marginal histograms (Figure 2, named “BET-Figure 8”).

In this last stock assessment, Relative Spawning Biomass (SSB_{2019}/SSB_{MSY}) was set at 0.94 (0.71-1.37) and the stock status was estimated at 58% overfished. As shown in the Kobe plot below, the stock is slightly below limits and catches from the countries under assessment are not negligible, so the fishery has been assessed under category D, as per guidance.



BET-Figure 8. Stock Synthesis: Kobe plot of SSB/SSB_{MSY} and F/F_{MSY} for stock status of Atlantic bigeye tuna in 2019 based on the log multivariate normal approximation across the 27 uncertainty grid model runs of Stock Synthesis with an insert pie chart showing the probability of being in the red quadrant (48.9 %), green quadrant (41.1 %), orange (0.8%) and in yellow (9.2 %). Blue circle is the median and marginal histograms represent distribution of either SSB/SSB_{MSY} or F/F_{MSY} .

Source: ICCAT 2021b

Therefore, the species is still considered, in its most recent stock assessment, to have a biomass below the limit reference point (or proxy and removals are not negligible, consequently, the stock FAILS clause C1.2.

As per guidance, the stock is slightly below limits and catches from the countries under assessment are not negligible, so the fishery has been assessed under category D.

References

Collette, B.B., Boustany, A., Fox, W., Graves, J., Juan Jorda, M. & Restrepo, V. 2021. *Thunnus obesus*. The IUCN Red List of Threatened Species 2021: e.T21859A46912402. <https://dx.doi.org/10.2305/IUCN.UK.2021-2.RLTS.T21859A46912402.en>.

ICAAT 2021a. REPORT OF THE 2021 ICCAT BIGEYE TUNA STOCK ASSESSMENT MEETING (Online, 19- 29 July 2021): https://www.iccat.int/Documents/SCRS/DetRep/BET_SA_ENG.pdf

ICAAT 2021b. Summary of the REPORT OF THE 2021 ICCAT BIGEYE TUNA STOCK ASSESSMENT MEETING (Online, 19- 29 July 2021): https://iccat.int/Documents/SCRS/ExecSum/BET_ENG.pdf

ICCAT stock assessments: <https://iccat.int/en/assess.html>

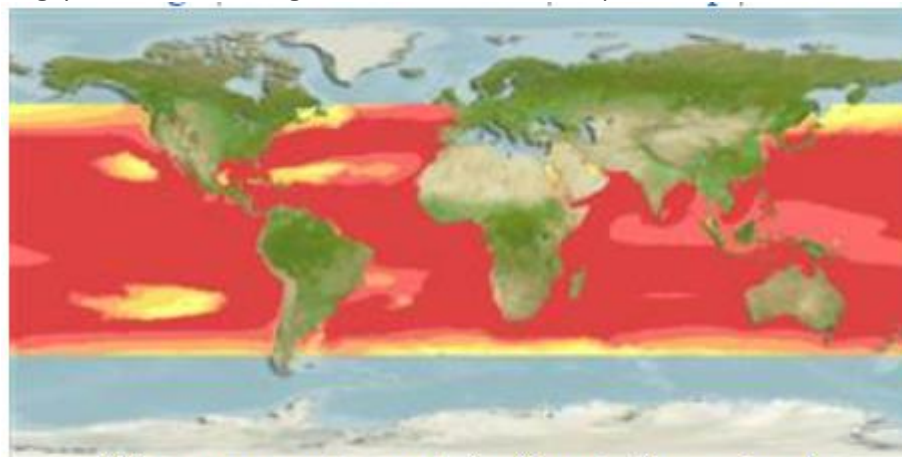
Links

MarinTrust Standard clause	1.3.2.2
FAO CCRF	7.5.3
GSSI	D.3.04, D5.01

CATEGORY D SPECIES

Category D species are those which are not subject to a species-specific management regime. In the case of mixed trawl fisheries, Category D species may make up the majority of landings. The comparative lack of scientific information on the status of the population of the species means that a risk-assessment style approach must be taken.

D1	Species Name	Bigeye tuna (<i>Thunnus obesus</i>)	
	Productivity Attribute	Value	Score
	Average age at maturity (years)	2.3	2
	Average maximum age (years)	11.6	2
	Fecundity (eggs/spawning)	4,274,342 [2,900,000-6,300,000]	1
	Average maximum size (cm)	250	3
	Average size at maturity (cm)	97.4	2
	Reproductive strategy	Broadcast spawner	1
	Mean trophic level	4.5	3
	Average Productivity Score		2
	Susceptibility Attribute	Value	Score
	Availability (area overlap)	Between 25% and 50% of the stock occurs in the area fished/Global distribution	2
	Encounterability (the position of the stock/species within the water column relative to the fishing gear)	Pelagic-oceanic, usually 0-500m	2
	Selectivity of gear type	Species > 2 times mesh size or up to 4 m length	3
	Post-capture mortality	Most dead or retained trawl tow > 3 hours	2
	Average Susceptibility Score		2.25
	PSA Risk Rating (From Table D3)		TABLE D4
	Compliance rating		FAIL
	Further justification for susceptibility scoring (where relevant)		
	For susceptibility attributes, please provide a brief rationale for scoring of parameters where there may be uncertainty affecting your decision.		
	The assessed fishery occurs in the FAO areas 34,41,47, which covers the half of the stock of Atlantic bigeye tuna, which has a global distribution for adult species		



This map was computer-generated and has not yet been reviewed.
Thunnus obesus AquaMaps Data sources: GBIF OBIS

References

Fishbase. *Thunnus obesus* (Lowe, 1839) Bigeye tuna:

<https://www.fishbase.se/Summary/SpeciesSummary.php?ID=146&AT=bigeye>

Standard clauses 1.3.2.2

Table D2 - Productivity / Susceptibility attributes and scores.

Productivity attributes	Low productivity/ High risk	Medium productivity/ Medium risk	High productivity/ Low risk
	Score 3	Score 2	Score 1
Average age at maturity (years)	>4	2 to 4	<2
Average maximum age (years)	>30	10 to 30	<10
Fecundity (eggs/spawning)	<1 000	1 000 to 10 000	>10 000
Average maximum size (cm)	>150	60 to 150	<60
Average size at maturity (cm)	>150	30 to 150	<30
Reproductive strategy	Live bearer, mouth brooder or significant parental investment	Demersal spawner "berried"	Broadcast spawner
Mean trophic level	>3.25	2.5–3.25	<2.5

Susceptibility attributes		High susceptibility/ High risk	Medium susceptibility/ Medium risk	Low susceptibility/ Low risk
		Score 3	Score 2	Score 1
Availability	1) Overlap of adult species range with fishery	>50% of stock occurs in the area fished	Between 25% and 50% of the stock occurs in the area fished	<25% of stock occurs in the area fished
	2) Distribution	Only in the country/ fishery	Limited range in the region	Throughout region/ global distribution
Encounterability	1) Habitat	Habitat preference of species make it highly likely to encounter trawl gear (e.g. demersal, muddy/sandy bottom)	Habitat preference of species make it moderately likely to encounter trawl gear (e.g. rocky bottom/reefs)	Depth or distribution of species make it unlikely to encounter trawl gear (e.g. epi-pelagic or meso-pelagic)
	2) Depth range	High overlap with trawl fishing gear (20 to 60 m depth)	Medium overlap with trawl fishing gear (10 to 20 m depth)	Low overlap with trawl fishing gear (0 to 10 m, >70 m depth)
Selectivity		Species >2 times mesh size or up to 4 m length	Species 1 to 2 times mesh size or 4 to 5 m length	Species <mesh size or >5 m length
Post capture mortality		Most dead or retained Trawl tow >3 hours	Alive after net hauled Trawl tow 0.5 to 3 hours	Released alive Trawl tow <0.5 hours

Note: Availability 2 is only used when there is no information for Availability 1; the most conservative score between Encounterability 1 and 2 is used.

D3		Average Susceptibility Score		
		1 - 1.75	1.76 - 2.24	2.25 - 3
Average Productivity Score	1 - 1.75	PASS	PASS	PASS
	1.76 - 2.24	PASS	PASS	TABLE D4
	2.25 - 3	PASS	TABLE D4	TABLE D4

D4		Species Name	Bigeye tuna (<i>Thunnus obesus</i>)
		Impacts On Species Categorised as Vulnerable by D1-D3 - Minimum Requirements	
	D4.1	The potential impacts of the fishery on this species are considered during the management process, and reasonable measures are taken to minimise these impacts.	Yes
	D4.2	There is no substantial evidence that the fishery has a significant negative impact on the species.	No
Outcome:			FAIL

Evidence

D4.1: The potential impacts of the fishery on this species are considered during the management process, and reasonable measures are taken to minimise these impacts.

The Atlantic bigeye tuna stock in 2019 was estimated to be overfished but not undergoing overfishing. According to the Kobe 2 Strategy Matrix (K2SM), a future constant catch of 61,500 t, which is the TAC established in Rec. 19-02, will have a high probability (97%) of maintaining the stock in the green quadrant of the Kobe plot by 2034. This would leave the stock in a state consistent with the Convention objectives and the recovery plan in Rec. 19-02. The K2SM, incorporates some of the known main sources of uncertainty, however, some other sources of relevant uncertainties were not included in the development of the K2SM, including the appropriateness of the range of natural mortalities used in the uncertainty grid and the change in methodology used to develop the joint longline index. Therefore, current stock status and the outlook for the stock are more uncertain than portrayed in the Summary Table and the K2SM. Projection probabilities should be interpreted with caution. Until such additional sources of uncertainty can be properly incorporated in the estimation of stock status and the K2SM, the Commission should consider adopting a TAC that would shift the stock status of bigeye tuna towards the green zone of the Kobe plot with a high probability. The Commission should be aware that increased harvests on small fishes could have had negative consequences for the productivity of bigeye tuna fisheries (e.g. reduced yield at MSY and increased SSB required to produce MSY). Rec. 19-02 contains measures adopted by the Commission aimed at increasing long-term sustainable yield by reducing the catch of juveniles of tropical tunas. It is too early to know the extent by which these measures have reduced mortality of juvenile bigeye tuna.

Conservation & management measures in effect (Rec. 16-01, Rec. 18-01, Rec. 19-02):

- Total allowable catch for 2020-2021 was set to 62,500 and 61,500 t respectively for Contracting Parties and Cooperating non-Contracting Parties, Entities or Fishing Entities,
- Specific limits of number of longline boats; China (65), Chinese Taipei (75), Philippines (5), Korea (14), EU (269) and Japan (231),
- Specific limits of number of purse seine boats; EU (34) and Ghana (17),
- No fishing with natural or artificial floating objects from 1 January to 31 March in 2021, throughout the Convention area,
- No more than 300 Fish aggregating devices (FADs) active at any time by vessel.

– Use of non-entangling FADs.

Therefore, the potential impacts of the fishery on this species are considered during the management process, and reasonable measures are taken to minimise these impacts, so it PASSES clause D4.1.

D4.2 There is no substantial evidence that the fishery has a significant negative impact on the species.

Results of the uncertainty grid of Stock Synthesis runs show a long-term decline in spawning stock biomass (SSB) from the beginning of the fishery, accelerating from 1970 to 2000 and a relative stable SSB in the last 20 years. Relative fishing mortality increased from the beginning of the fishery until 1999, rapidly declined from 1999 to 2008 and has been relatively stable since. Recruitment estimates for the recent period of 2015-2019 show an increasing trend, in spite of the relative stability of recent SSB. The Stock Synthesis uncertainty grid shows 1950-2019 trajectories of increasing F and decreasing B towards the red area of the Kobe plot ($F > F_{MSY}$ and $SSB < SSB_{MSY}$). Overfishing starts in around 1993 and the stock becomes overfished around 1997, therefore reaching the red quadrant of the Kobe plot and mostly remained in the red quadrant until 2019 when overfishing ceased (Figure 2, named “BET-Figure 8” above). The results of the assessment, based on the median of the entire uncertainty grid shows that in 2019 the Atlantic bigeye tuna stock status was estimated at 58% overfished (median $SSB_{2019}/SSB_{MSY} = 0.94$ and 80% CI of 0.71 and 1.37) and was not undergoing overfishing (median $F_{2019}/F_{MSY} = 1.00$ and 80% CI of 0.63 and 1.35). The average of MSY was estimated as 86,833 t with (80% CI of 72,210 and 106,440) from the uncertainty grid deterministic runs.

The stock is slightly below limits and catches from the countries under assessment are not negligible (except Italy). The outlook predicts that the modelled stock could not sustain some of the constant high TACs in the long term, as SSB was predicted to decline below a safe threshold. This safe threshold indicator of very low SSBs that may compromise the rebuilding ability of a stock when such low levels of biomass are reached. Thus, the fishery’s continued constant fishing pressure on the stock could have a significant negative impact on the species (e.g. inhibiting the stock from recovery).

Therefore, it cannot be reasonably considered that there is no substantial evidence that the fishery has a significant negative impact on the species, so it FAILS clause D4.2.

References

ICCAT stock assessments: <https://iccat.int/en/assess.html>

ICAAT 2021. REPORT OF THE 2021 ICCAT BIGEYE TUNA STOCK ASSESSMENT MEETING (Online, 19- 29 July 2021): https://www.iccat.int/Documents/SCRS/DetRep/BET_SA_ENG.pdf

ICAAT 2021. Summary of the REPORT OF THE 2021 ICCAT BIGEYE TUNA STOCK ASSESSMENT MEETING (Online, 19- 29 July 2021): https://iccat.int/Documents/SCRS/ExecSum/BET_ENG.pdf

Links

MarinTrust Standard clause	1.3.2.2, 4.1.4
FAO CCRF	7.5.1
GSSI	D.5.01